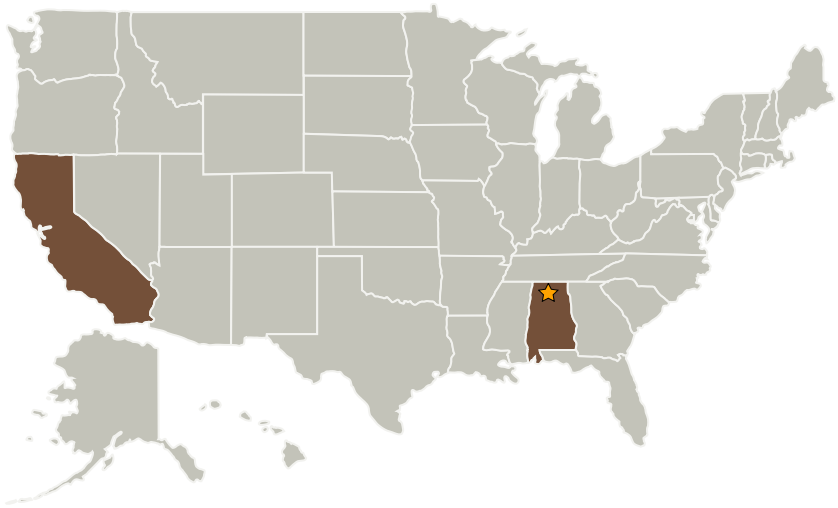
Rigidizing Inflatable Deployable Dwelling (RIDD), Phase I

Completed Technology Project (2006 - 2006)

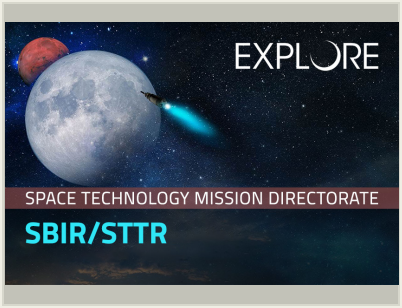
Project Introduction

By combining thin thermoplastic films, woven Vectran reinforcements, and heat a reliable, deployable, rigidizing space habitat can be created. Although much research has been performed on rigidizing space structures, characteristic material flaws prevent reliable deployment of rigidizing extraterrestrial habitats. Many materials fail space qualification due to the catalytic nature of their rigidization method. However, by layering thin low-density polyethylene with virtually any composite weave, a pliable composite is created. When inflation pressure and heat are applied, the low density polyethylene melts into the composite weave and causes the entire matrix to harden. The proposed composite would consist of Vectran with a low-density polyethylene laminate. Because our composite is stable at nearly cryogenic temperatures through around 100 C, it outperforms most other rigidizing materials currently being studied. The thermal properties coupled with nearly zero creep provide strong promise for its compatibility with rigidizing habitats.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Marshall Space Flight Center(MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
Firestar Engineering, LLC	Supporting Organization	Industry	Mojave, California



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Marshall Space Flight Center (MSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations	
Alabama	California

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.1 Materials
    - TX12.1.6 Materials for Electrical Power Generation, Energy Storage, Power Distribution and Electrical Machines